

Enhancing Early Speech, Parental Bonding, and Infant Physical Development

Using Prenatal Intervention in Standard Obstetric Practice

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*In honor of JOPPPAH's 35th anniversary, the following is a reprint of one of the first articles in the very first edition of the journal. At that time, in the spring of 1986, the journal was titled **Pre- and Peri-Natal Psychology Journal**, both created and edited by Dr. Thomas Verny. The current Editor-in-Chief has taken the liberty to copy-edit the original article, and realizes some of the information may feel outdated. However, given that March was Birth Psychology Month, and the focus was on prenatal bonding, this article seemed appropriate to share again.*

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Over the past 10 years, there has been an exponential increase of our knowledge and awareness of fetal-sensory capability and consciousness (Verny & Kelly, 1981; Chamberlain, 1983). Interest in the possibility of the effects of prenatal-fetal stimulation upon fetal learning has been investigated by Verny et al. (1981), DeCasper (1985), and Van de Carr et al. (1984). Most studies in this area have concentrated upon laboratory investigation of fetal capabilities and potential ability to respond to

[The following biographical information was taken from the website: www.brillbaby.com/early-learning/experts/rene-van-de-carr-1.php]. **Rene Van de Carr, MD**, is one of the earliest pioneers of prenatal stimulation and teaches parents how to stimulate their unborn babies through music and other exercises at his Prenatal University in California. In his book, *While You Are Expecting: Your Own Prenatal Classroom* (1997/2014), he writes, "There is a critical time in an infant's development beginning at about five months into pregnancy. Interaction between the baby and its environment stimulates brain growth both before and after birth." This is the fundamental principal on which he bases his program, developed in 1979 after his research showed how babies could benefit from prenatal stimulation. Since his initial research, Van de Carr, along with coauthor, **Marc Lehrer, PhD**, has collected data on more than 3,000 children born after going through the Prenatal University program.

prenatal interventions (Sontag, 1944; Spelt, 1948; Jensen & Flottorp, 1982). Investigators have also been interested in how parents and infants initially bond after birth (Klaus & Kennell, 1982; Swanson, 1978; Peterson & Mehl, 1978; Sveja, 1980). Until recently, these studies have primarily concentrated upon the mother's role in bonding with her newly-born infant. The father's role in becoming acquainted with his new offspring has received little or no attention until quite recently (Greenberg & Morris, 1984). Most of the studies on parent-infant bonding have concentrated upon the emotional readiness of parents prior to the birth of their babies in relation to how parents rated their interaction with their new babies (Roberts, 1983) or in programs designed to enhance emotional bonding after birth by enhancing emotional bonding prior to birth, such as the small group study by Carter-Jessop (1981).

The Prenatal University program, as started by Van de Carr (1979), is unusual in that it has been exclusively used in private medical and birthing practices with patients who are undergoing regular obstetric care prior to the birth of their infants. Thus, it represents applications of prenatal stimulation to the general population and is meant for clinical use. The program presents materials designed to enhance fetal development, early communication, brain growth, and better health practices during pregnancy. Parents who use this program receive this information.

The formal aspects of the program include an instruction manual that is given to parents three to four months before the expected due date of the baby, a video tape that is viewed by the parents in the physician's office, a brief question and answer period with the primary physician, and audio tapes of the manual, if requested. The instruction manual for prenatal enhancement includes exercises designed to create paired associations between words spoken by the parents and simultaneously presented physical actions, and tactile and visual stimuli. The program also presents guidelines to assess optimal fetal responses, recommendations for proper diet to keep the mother in good health, and suggestions for supplements to promote brain growth in the fetus.

The manuals are written in easy-to-understand language to maximize use by parents of varied educational backgrounds. The exercises are also designed to aid in mother-infant bonding and father-infant bonding as the parent does the exercise in cooperation with other family members. The parents learn to treat the pre-nate as a developing organism with an individualized reactivity to the presented stimuli. Cooperative activities and role-modeling prior to the birth of the baby are also designed to promote communication and to develop parent responsiveness to fetal activity as a model for later positive interaction with the infant (Van de Carr & Lehrer, 1984).

We have recently added a second instructional manual and series of exercises for the first four months following birth. The emphasis in this part of the program is on providing continuity for the presented word lists from the prenatal period and to further enhance early decision-making capabilities in the infant. The philosophy of the instructional manual deemphasizes the notion of “packing” the infant with stimuli and instead, uses the fetal and infant responses as guides for presenting enhancement exercises (Van de Carr & Lehrer, 1984).

Currently, the Prenatal University program has been used with over 700 families. This database represents a special population for investigation of the effects of prenatal stimulation upon a number of physical, sensory, cognitive, emotional, and interactive factors in the birth process and early infancy. Recently, a number of physicians and birth centers have begun using the program materials, so we expect to be reporting upon the effects from a growing population of stimulated infants in the future. Our most recent findings show that the program is also effective when applied in economically-stressed populations (Van de Carr, 1985; Van de Carr et. al., 1984).

For the purpose of this article, we are reporting a sampling of results drawn from a longitudinal study that is currently in progress. We choose to select a few items for comparison, which demonstrate aspects of the areas we are investigating. These include: the onset of early speech communication abilities in infants who have received the Prenatal University program during the mother’s pregnancy; facilitation of mother-infant bonding as measured by ease of breastfeeding; facilitation of father-infant relationship as perceived by the mother; and early physical development as measured by the emergence of teeth in the infant. These items are representative of a number of additional factors we are investigating with this population of infants.

Methodology

Our hypotheses are that prenatal intervention (i.e. the use of a prenatal program by parents) enhances aspects of:

- 1) Fetal development leading to increased early infant responsiveness and capability.
- 2) Health practices during pregnancy.
- 3) Formation of bonding between the infant and mother, providing the mother and infant with more opportunity for developing a productive relationship and reducing maternal stress levels.
- 4) The father’s willingness to become involved during early infant care, further supporting the mother’s role, and, in addition,

increasing the father's ability to support the infant's developmental progress and reducing paternal stress levels.

- 5) Maternal and paternal responsiveness to the infant's activity and needs, resulting in improved parenting skills.

To test aspects of these hypotheses, we selected four items for comparison from a much larger questionnaire. The questionnaires were mailed to parents who were patients in the private obstetric practices of two physicians using the Prenatal University Program. These patients were drawn from a metropolitan population representative of a normative population in the greater Bay Area of Northern California. Mailings of questionnaires went to all patients in the obstetrics practices who had youngsters who would be six months to three years old at the time of the mailing. The questionnaires included background information, parents' use of prenatal programs and other prenatal activities, attitudes and feelings about obstetric care and birth experiences, onset of physical, sensory, motor, communicative, and cognitive capabilities of the infant, quality of feeding, play, toilet training, and responsiveness to pain, and perceived relationships between the baby and mother and the baby and father.

Three groups were formed from the respondents. Raters, who were uninformed as to the identities of the respondents, determined if the respondent used the Prenatal University Program two times per day (the currently recommended time is two times per day for five minutes each time; FP group, i.e. full participants); less than two times per day and more than one time per week (PP, i.e. partial participants); or did not use the program at all (NP, i.e. non-participants).

The first 50 respondents in each group were selected for evaluation on questions drawn from the comprehensive questionnaire which would test the following factors:

- A) First communication and first recognizable spoken words as perceived by the mother (early speech factor).
- B) Ease and duration of breastfeeding (mother-infant bonding factor).
- C) The father's relationship with the infant (father-infant bonding).
- D) Emergence of the baby's first teeth (physical maturation of infant).

Results

The three groups of 50 respondents each were compared using tests for each question. The results of all of these comparisons were statistically significant at .05%. The analysis is as follows.

The consistent finding was the enhancement of early infant communication and aspects of maternal and paternal bonding in the FP group as compared to the NP group. A similar, although less enhanced, effect was found in the PP group compared to the NP group. In addition to being statistically significant, the observed differences in mean scores are also clinically significant, showing a clearly superior pattern of early infant capability, development, and family bonding patterns in the FP and PP groups as compared to the NP group. These findings are consistent with other aspects of our study as well. Also consistent with these results were written accounts of the infants' capabilities and relationships with parents. See Table 1.

The sampling of results in this brief report are remarkably consistent in demonstrating a range of positive effects in infants who were given a prenatal enhancement program presented as part of regular obstetric practice. First, early attempts at communication and recognizable spoken words occur much earlier in the prenatally-enhanced infants. Second, mothers breastfeed these infants longer and are far less likely to blame the infant for difficulties in breastfeeding. Third, fathers are seen as developing a stronger-than-average relationship with these infants. Finally, teeth develop more quickly in these infants, and in a surprising number of instances, were present at birth.

Discussion

Several factors seem worthy for discussion. In our study, the early speech factor could measure: a) early instances of communication in the prenatally-enhanced infants; b) a tendency for parents to be more observant and expectant of early speech and, thus, recognize attempts at communication and early utterances in their infants before parents who were not looking for these signs; c) effects of early infant training by parents who had followed the prenatal enhancement program during pregnancy and continued it during early infancy; or d) an artifact of parents wanting to believe that their infants were communicating at an earlier-than-expected age.

Videotapes in our possession of babies saying words at four months and younger and numerous personal reports and observations of these infants lead us to believe that some combination of true early communication, better observation, and continuing instruction by the parents of the prenatally-enhanced infant account for the emergence of communication skills in these infants. See Tables 1 and 2.

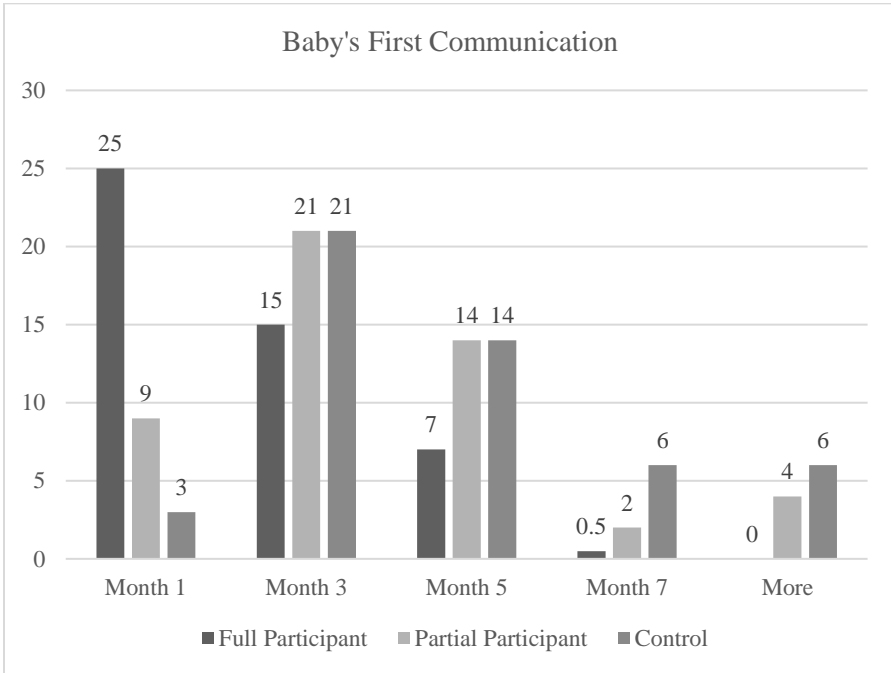


Table 1 Factor 1: Early infant speech

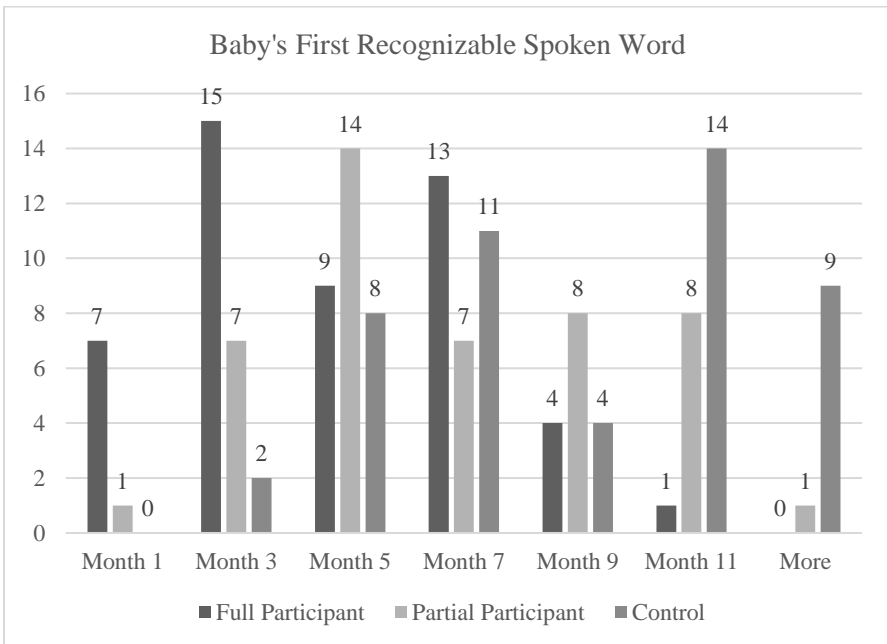


Table 2 Factor 1: Early infant speech

The results of the items involving breastfeeding show important relational differences between mothers who had used the prenatal enhancement program in comparison to mothers who had not used the program. First, mothers who used the program were far more likely to continue breastfeeding over three months than mothers who did not use the program. We consider this to signify the development of a closer and more intimate relationship between the mother and developing infant. Second, mothers who used the program were far less likely to blame the infant if there was a problem in initiating breastfeeding. We feel this finding has even more significance in demonstrating the beginnings of a more positive maternal bond in those families that used the prenatal enhancement program. See Table 3.

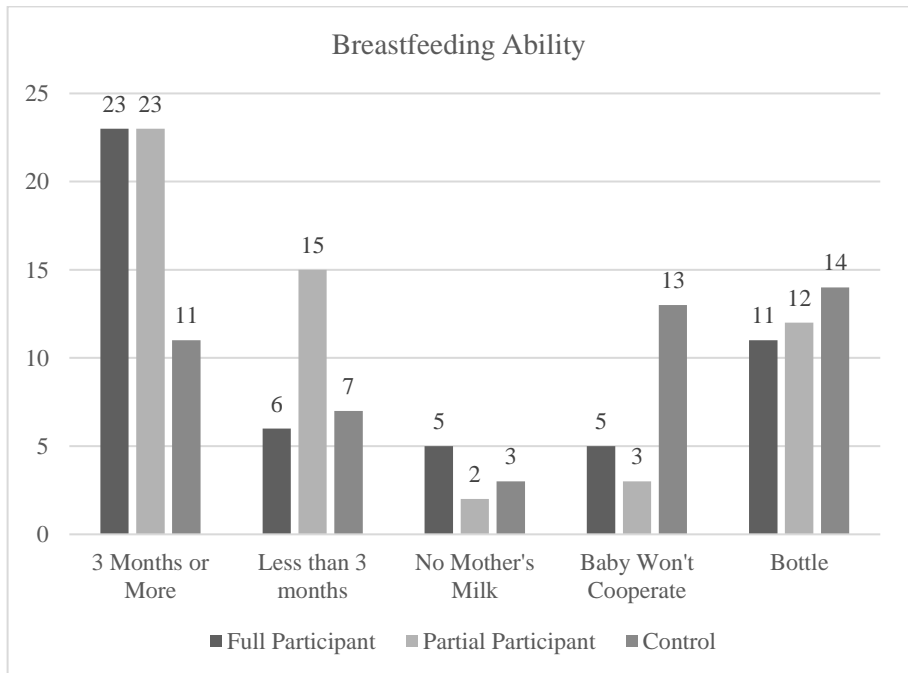


Table 3 Factor 2: Maternal Bonding: Ease and duration of breastfeeding

The results concerning the father’s relationship with the baby show an enhancement of the father’s relationship with the baby as evaluated by the mother. We feel this finding demonstrates the effects of both a better relationship between father and infant in the prenatally-enhanced

groups, as well as pointing to more coordinated relating between parents of these infants. The Prenatal University program has the father do the same exercises as the mother with the fetus, learning to coordinate his efforts with the mother before the baby is born. We feel this helps parents learn to support each other before the times of maximal stress and disruption of their routines that typically occur after the baby is born. See Table 4.

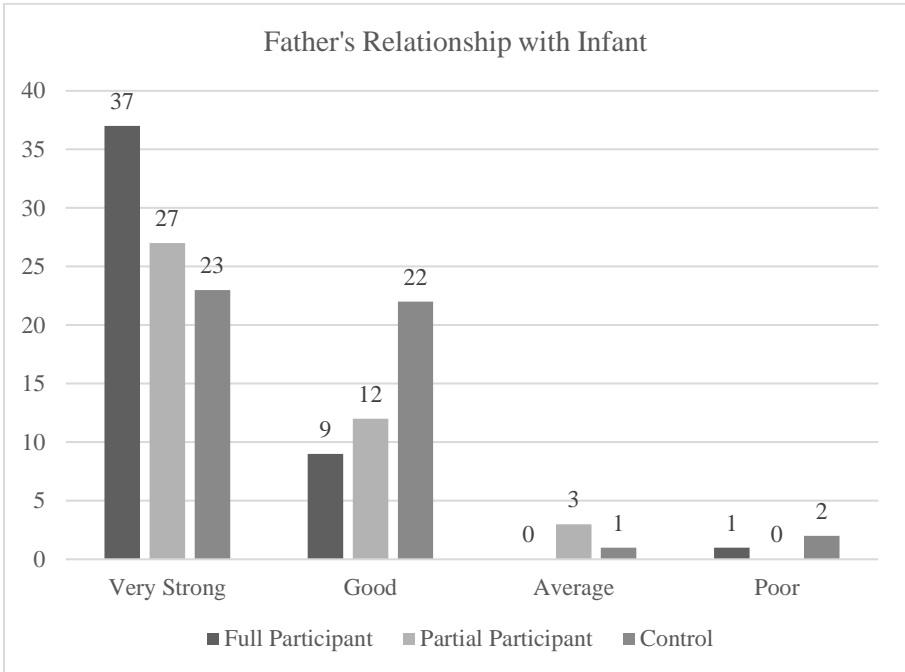


Table 4 Factor 3: Paternal Bonding: Husband/partner’s relationship with infant

Finally, the results of early development of teeth are most interesting. In our group of 100 prenatally-enhanced youngsters, there were three instances of babies born with teeth (all in the full participant group). There were a total of eight babies in the FP and PP groups who had teeth by two months (four FP & one PP). There were no differences in length of pregnancy between the groups, so we cannot ascribe this finding to the effects of longer in-utero maturation. Massler and Sarava (1950) report that the normal instance of teeth by one month is 1 in 2000. Our findings in this sample of the Prenatal University population is 8 in 1000. This is quite a remarkable difference. See Table 5.

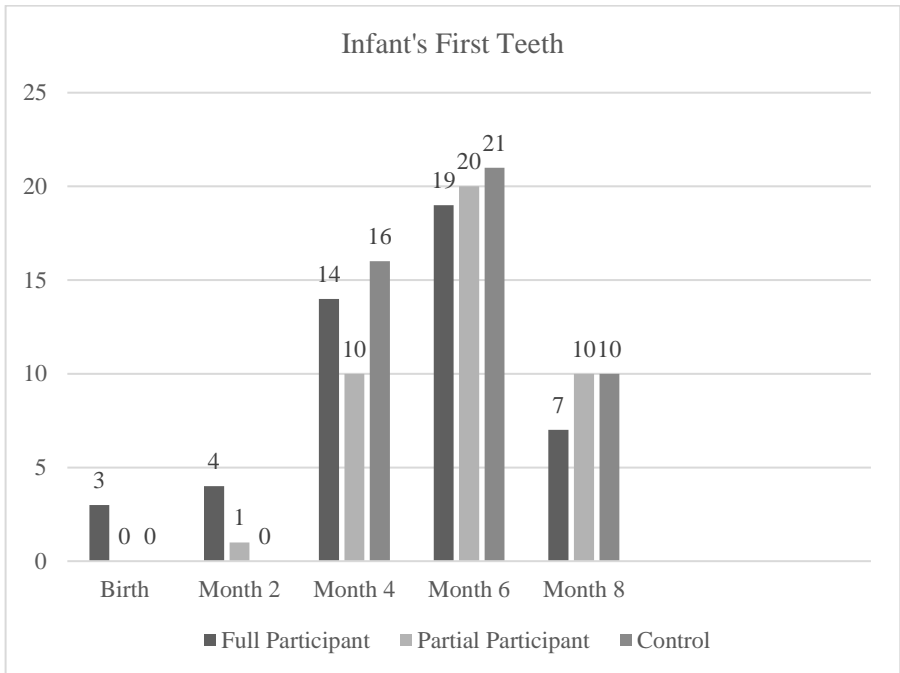


Table 5 Factor 4: Physical Development: Emergence of baby’s first teeth

We feel the Prenatal University program has effects that are attributable to both fetal stimulation and superior fetal environment. Parents using the program are likely to eat better, smoke less, and drink alcohol less. We therefore see the finding of early development of teeth as possibly indicative of nutritional enhancement or a result of developmental acceleration. Interestingly, the mothers of these infants reported no difficulties with breastfeeding.

Conclusion

Our findings as reported in this article are taken from an ongoing larger study that is showing similar results. It is our conclusion that the Prenatal University program produces a number of remarkable effects in the developing infant and infant-parent interactions. The program is meant to take only five minutes twice per day during the last three to four months of pregnancy and is designed to be used in connection with standard obstetric and birthing center practices. A second and even more

meaningful conclusion from these findings points to a rethinking of our notions of early infant capabilities and ways to enhance early parent-infant communication.

A great many of the normative findings about early infant capabilities have come from observations of precious generations of heavily-medicated birthing practices of the 1930s, 40s, and 50s. These clinical practices tended to depress the newborn infant's abilities for learning. Our findings indicate that not only the infant, but the pre-nate as well, is far more capable of learning than we have previously thought. In addition, we would strongly recommend promoting education programs for new parents before the baby is born, rather than waiting until after the birth of the baby. The mothers participating in the Prenatal University program emphasize cooperative relating to the baby before the baby is born as well as promoting better parent-infant bonding.

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